ENGINEERING ANALYSIS

Source Name: **Service Center Metals** Permit No.: **52460-02**

Source Location: **6000 Quality Way, Prince George, VA 23875** Engineer: **EDS**

Date: **September 30, 2016**

I. Introduction and Background

A. Company Background

Service Center Metals (SCM) is a secondary aluminum facility located in Prince George, Virginia. SCM's production process melts aluminum scrap to make finished extruded products including solid round rods, square and rectangular bars, tubes, pipes, structural extrusions such as angles, channels and I-beams, and specialty products (e.g., gas meter housings). The facility is a synthetic minor source operating under a New Source Review (NSR) permit initially issued on December 19, 2013 and amended on June 22, 2016 for a Compact Remelt Plant consisting of three aluminum extrusion lines each consisting of a melting furnace and homogenization oven.

SCM was founded in 2002 and began operations in 2003 at which time was determined to be exempt from air permitting. In April 2012, SCM replaced small natural gas furnaces and installed a nitriding furnace to case harden aluminum extrusion dies. This too was exempt from permitting.

In December 2013, SCM received a minor NSR permit for installation and operation of a proposed Compact Remelt Plant consisting of three identical aluminum scrap processing lines to be built in three phases. The new lines allowed SCM to utilize some market aluminum scrap in addition to the scrap currently produced from their existing aluminum extrusion production lines. Phase 1 (line 1) began construction on December 20, 2013 and operation (startup) on April 29, 2014. A performance (stack) test and visible emissions evaluation was conducted July 15-17, 2014. On October 15, 2015, DEQ issued an extension to the 18-month requirement to begin construction on phase 2.

On April 18, 2016, the Department of Environmental Quality (DEQ) received an application from SCM requesting a change in design and rated capacity of the proposed line 2 melting furnace (HMF2) and homogenization oven (HD2). Additionally, SCM proposed to add a loose saw chip pretreatment and conveyor to line 2 (both of which have zero emissions). The application also requested to increase the throughputs of natural gas, flux, and aluminum charge. These changes are based on operational experience with the first line and projected market demand. The proposed replacement of the furnace and homogenization oven (HMF2 and HD2) was determined to meet the replacement criteria of APG-354; Permitting and BACT Applicability under Chapter 80 Article 6 Table 1 section 2.F. An administrative amendment issued on June 22, 2016, allowed SCM to begin construction of phase 2 with the replacement four-chambered furnace and homogenization oven. This amendment was issued with the intention for a future combined New Source Review (NSR) permit and State Operating Permit (SOP) to reflect the requested throughputs and emission limits for the replacement emission units, as well as, limitations to provide federally enforceability of hydrogen chloride (HCl), a federal HAP.

SCM is located in the Richmond-Petersburg Attainment Area (all pollutants) and the Richmond VOC and NOx Emission Control Area. The company is located on a site that is suitable from an air pollution standpoint. The last air inspection (Full Compliance Evaluation – FCE) was conducted at the facility on October 21, 2015, and the facility was found to be in compliance.

B. Proposed Project Summary

This action modifies the New Source Review (NSR) permit and combines it with a State Operating Permit (SOP) to incorporate all changes as originally requested in SCM's application. The SOP conditions will be public noticed, reviewed by EPA, and used to establish federally enforceable limits on potential to emit of hydrogen chloride (HCl) to remain an area source of hazardous air pollutants (HAPs) subject to only the area source requirements of 40 CFR 63 Subpart RRR—National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production.

SCM requests to increase operating line 1 and future line 3 throughputs to 45,000 tons/year each and the future line 2 throughput to 60,000 tons/year. Initially, SCM requested a flux increase from 80 to 125 lb flux/50 tons of aluminum melt (2.5 lb flux/ton melt) for all three lines. After reviewing the draft permit and an evaluation the current on proposed operations, SCM has requested a flux usage of 2 lb flux/ton melt. This reduces the throughput of flux to 45 tons each for HMF1 and 3 and 60 tons for HMF2. The HCl emission limits were reduced accordingly.

The emissions increase of PM, PM10, and PM 2.5 is greater than the exemption rates for projects, therefore this modification is subject to Article 6 permitting. DEQ will issue a combined NSR and SOP for federal enforceability of HCl emissions. This combined permit supersedes the June 22, 2016 NSR permit and combines all requirements into one permit.

C. Process and Equipment Description

SCM is a compact remelt facility consisting of melting furnaces, homogenization ovens, and ancillary equipment that turn scrap aluminum into logs for future products.

See the equipment list in the permit's Introduction.

D. Project Schedule

Date permit application received in region: April 18, 2016
Date application was deemed complete: June 30, 2016 (SOP application fee)
Proposed construction commencement date: Upon permit issuance
Proposed start-up date: December 2016

II. Emissions Calculations (see attached spreadsheets)

UER Increase for a Project

Pollutant	Total UER (tons/yr)	9 VAC 5-80-1105 D.1 Exemption Rates for Projects (tons/yr)	Subject to Article 6 Permitting & BACT?
PM	0.0	15	No
PM-10	0.0	10	No
PM 2.5	0.0	6	No
SO_2	0.0	10	No
NOx	0.0	10	No
CO	0.0	100	No
VOC	0.0	10	No

III. Regulatory Review

The proposed project is not a major new source or a major modification nor does the proposed project trigger PSD or Nonattainment requirements.

The melting furnaces (group 1 furnace) are subject to 40 CFR Part 63 Subpart RRR-National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production (MACT Subpart RRR or MACT). Since the last permit issuance, EPA published revisions to MACT Subpart RRR on September 18, 2015 and was modified by a direct final rule signed on May 27, 2016 and effective September 12, 2016 unless EPA receives adverse comments.

MACT Subpart RRR contains both major and area source requirements. SCM's NSR/SOP permit establishes operating parameters and throughputs to maintain area source status (emit <10 tons/yr of any single HAP and <25 tons/yr combination of HAPs). Area sources, such as SCM's group 1 furnaces processing other than clean charge, are subject only to the dioxin/furan (D/F) requirements of MACT Subpart RRR. Each group 1 furnace at a secondary aluminum production facility (major or area) must comply with the emission limit of 15 µg of D/F TEQ per Mg (2.1×10^{-4} gr of D/F TEQ per ton) of feed/charge and are required to test for D/F using EPA Method 23. Major sources are also subject to PM (surrogate for metal HAP), HCl, and HF limits. As an area source, PM and HCl emissions from SCM's group 1 furnaces are not specifically subject to the limits and testing in the MACT. In other words, the HCl emissions from flux usage are addressed in the MACT but are not applicable to area sources. 9 VAC 5-60-300 C exempts emissions units from state toxics regulations when subject to a MACT; therefore, metal HAPs and HCl emissions were not evaluated for state toxics.

A. Criteria Pollutants

Criteria pollutant modeling was not conducted since the facility is not a suspected NAAQS violator and the proposed emissions increase are less than DEQ modeling significance levels.

Criteria Pollutants	Emissions Increase from a Project (tons per year)	Increase in Permitted Emissions (tons per year)
PM10	15	2.5
PM2.5	10	0.8
CO	100	3.3
NOx	40	1.9
SO2	40	0.1

B. Toxic Pollutants

The facility's group 1 furnaces are subject to MACT Subpart RRR, specifically an emission limit of 15.0 µg of D/F TEQ per Mg feed charge. They must conduct performance testing to demonstrate compliance with this emission limit. The furnaces are exempt from state toxics review and modeling since these units are exempt by 9 VAC 5-60-300C. However, it was necessary to control HCl emissions by placing limitations on flux usage and to require lime injection. These conditions need federal enforceability, and as such, a SOP with public participation. All other emission units, burners and ovens, are natural gas combustion sources and HAPs/toxics are minimal. See Table 5 - Estimated HAPS Emissions in the application.

C. Control Technology

The source uses baghouses for the control of particulate, low NOx burners for the control of NOx, and lime injection for the control of HCl (non-PM/non-VOC HAP). The proposed control strategies are considered the Best Available Control Technology (BACT) for this source type. Lime injection is Maximum Available Control Technology (MACT) for major sources subject to 40 CFR 63, Subpart RRR. SCM uses lime injection to limit potential to emit (PTE) of HCl from the fluxing process, thus maintaining area source status.

IV. Initial Compliance Determination (including references)

A. Stack Testing – Initial dioxin/furan (D/F) testing is required for areas sources subject to MACT RRR. July 2014, SCM tested and demonstrated compliance with D/F emissions from melting furnace (HMF1). The requirement to conduct stack testing is not included in the permit, but stated in the cover letter since it is a MACT requirement.

B. Visible Emission Evaluation (VEE) – Concurrently with the July 2014 stack test, SCM demonstrated compliance with the 10% opacity limitation from melting furnace (HMF1). No additional VEE's are required for the other furnaces.

V. Continuing Compliance Determination

A. Continuous Emission Monitoring Systems (CEMS) – There are no CEMS at this facility.

B. Recordkeeping – The source will keep records of throughputs for aluminum production, flux, and natural gas, maintenance and operator training, stack testing and any VEE results, MSDS, malfunctions, and control device monitoring records. Additionally, SCM must comply with monitoring, notification, testing, reporting, and recordkeeping requirements of the MACT as stated in the cover letter.

C. Further Testing – There is no requirement for further testing of area sources.

VI. Public Participation

On September 30, 2016, the permit was public noticed and sent to EPA for the review of SOP Article 5 conditions only. ADD any comments…

VII. Other Considerations

A. File Consistency Review – The initial permit was based on permits for secondary aluminum plants such as Aleris (50099), Kaiser (50249) and Ball Aluminum (81090).

B. PRO Policy Consistency Review – The new NSR Skelton boilerplate moved the equipment list to the Introduction making it no longer an enforceable condition. Also, the reference to MACT RRR was removed from the equipment list and placed in the cover letter only. The MACT requirements are federally enforceable HAP requirements and cannot be included in a NSR Article 6 permit. SOP Article 5 permit conditions and public notice were used to provide federal enforceability of conditions limiting HCl emissions.

The following condition deviated from the Skeleton NSR/SOP boilerplates:
Introduction (previous Condition 1) – added "delegated" and "NSPS" to the table heading

The following conditions were revised:
Specified four and three chambered furnaces throughout

- Condition 2 – changed compressed saw chips to briquetted and loose saw chips
- Emission limits – split out three-chambered melting furnaces and four-chambered melting furnace; HCl emission limits with -850 citation
- Emission controls – split out baghouse and lime injection since one control limits PM

and the other HCl
- Condition 9 – updated change in fuel condition with new language
- Increased aluminum, flux, natural gas throughputs and emission limits accordingly
- Records of operation and control device monitoring for the baghouses
- Records of operation and monitoring records for the lime injection system and any corrective actions
- Initial Notifications and Permit Invalidation - removed HMF1

The following conditions were added to the permit:
- Condition 5 – Emission Control for NOx-low NOx burner requirement (original permit triggered BACT for NOx and the facility proposed the use of low NOx burners).
- Condition 6 – Monitoring Devices for baghouse differential pressure drop
- Condition 7– Monitoring Device Observation of baghouse differential pressure drop
- Condition 8 – Monitoring of lime injection system

The following conditions were deleted:
- Previous condition 11 – Requirement by Reference
- Previous condition 13 – D/F limits
- Previous condition – stack testing and VEE and EL for D/F
- All references to MACT Subpart RRR

C. Confidentiality – The facility did not request confidentiality.

D. Permit History
December 19, 2013 – permit for three natural gas-fired metal melting furnaces and associated homogenization ovens
June 22, 2016 administrative amendment-change melt furnace to match as installed

E. Fees – Paid $1,577 for a combined NSR (to increase throughputs) and SOP (for federal enforceability of HCl emissions).

VIII. Recommendations

Based on the information submitted, it is recommended that this permit be issued.

Regional Engineer: _____ Date: _____

Reviewing Engineer: _____ Date: _____

Attachments: Permit application
Calculation sheets
Emails of application fee posted